

NASA Biological Diversity and Ecological Conservation (BDEC)

Advancing understanding of biological diversity and supporting effective decision support for the conservation of nature

— 2024 Newsletter, Quarter 1 —

Happy 2024! Last year ended on a very high note with the successful completion of the airborne element of the BioSCape campaign. The BioSCape data constitute an incredible imaging spectroscopy and lidar baseline for very high biodiversity areas—terrestrial, freshwater, and marine—of the Greater Cape Floristic region, a premier global hotspot of biodiversity. BioSCape will contribute to a generation's worth of cutting-edge research as well as a number of practical conservation applications for the people of South Africa and the wider world. 2024 begins with NASA's groundbreaking launch of the PACE mission. We invite you to read more about this and other great news below.

It's Liftoff for NASA's PACE Mission!



After more than 21 years in the making, NASA's Plankton, Aerosol, Cloud, and ocean Ecosystem (PACE) Mission launches to polar orbit from Cape Canaveral Space Force Station's Space Launch Complex 40 at 1:33 a.m. EST Thursday, Feb. 8.

With an unprecedented coverage of broad wavelengths—from ultraviolet to infrared—PACE's data will extend and improve our satellite records of global ocean biology, aerosols, and clouds. PACE will enhance our understanding of how ocean organisms affect the atmosphere and coastal air quality; improving our estimates of oceanic carbon to better understand the global carbon budget & reduce uncertainty around carbon sources/sinks; and much more! How will you use PACE data?

Decline of the North American Avifauna



Kyle Horton, Assistant Professor at Colorado State University, leads research on predicting bird migration stopover. Through research funded by the NASA Biodiversity Program, Horton and team provided a first continental perspective of skyglow from peri-urban illuminated areas as an ecological threat to avian migrants. He co-authors a new opinion piece for PNAS on mitigation of bird collisions.

Last October, over 1,000 birds died in a single night after collisions with the Chicago convention center, as a high-intensity migration event coincided with severe weather. Birds are attracted to light coming from windows and experience fatal collisions as they are unable to perceive that they are solid. The center's lights remained on during events with improper window coverage, despite advanced bird forecasting predictions and the center's participation in the Lights Out Chicago Program. Solutions include treated glass that makes glass visible, reducing unnecessary lighting, strategically redirecting lights, and installing window shades. Farnsworth and colleagues propose that The Bird Treaty Act adopts a top-down enforcement strategy to protect birds from light and glass just as they are protected from poaching.

*Farnsworth, A., Horton, K., Marra, P. (2024). PNAS, 121(9), e2320411121.
<https://doi.org/10.1073/pnas.2320411121>*

[Read the Full Paper Here](#)

Funding Opportunities

Research Opportunities in Space and Earth Sciences 2024 (ROSES-2024) is now available. Over 100 different proposal opportunities. Access summary information, generalized proposal content, and due dates. We highlight 4 of this opportunities below.

**A.7
Biodiversity:**
Biodiversity and
Ecological
Conservation
(upon
amendment)

[Take
me to
A.7](#)

**A.47 Earth
Action:**
Community
Action for Equity
& Environmental
Justice

[Take
me to
A.47](#)

**A.67 Earth
Action:**
Supporting
Climate Resilient
Communities

[Take
me to
A.67](#)

A.6: CMS
Carbon
Monitoring
System

[Take
me to
A.6](#)

Recent BDEC Publications



Termite mound impacts on hydrology vary with herbaceous vegetation and topsoil texture.

Lind, B., Strydom, T., Hanan, N. P. 2023.

[10.1016/j.jaridenv.2023.104997](https://doi.org/10.1016/j.jaridenv.2023.104997)



Drivers of heterogeneity in tundra vegetation productivity on the Yamal Peninsula, Siberia, Russia.

Tassone, M. S., Epstein, H. E., Armstrong, A. H., Bhatt, U. S., Frost, G. V., Heim, B., Reynolds, M. K., Walker, D. A.

[10.1088/2752-664X/ad220f](https://doi.org/10.1088/2752-664X/ad220f)



Influences of Satellite Sensor and Scale on Derivation of Ecosystem Functional Types and Diversity

Liu, L., Smith, J. R., Armstrong, A. H., Alcaraz-Segura, D., Epstein, H. E., Echeverri, A., Langhans, E. K., Schmitt, J. P. R., Chaplin-Kramer, R. (2024). Environmental Research. Ecology, 3(1).

<https://doi.org/10.3390/rs15235593>



Uncovering the Hidden: Leveraging Sub-pixel Spectral Diversity to Estimate Plant Diversity from Space

Rossi, C., Gholizadeh, H. (2023) Remote Sensing of Environment. 296, 113734.

[10.1016/j.rse.2023.113734](https://doi.org/10.1016/j.rse.2023.113734)

Space-based Earth Observation and Biodiversity



The Committee on Earth Observation Satellites (CEOS) Ecosystem Extent Task Team, co-led by NASA Ecological Forecasting Program manager Gary Geller, released a white paper on the opportunities for and challenges of monitoring biodiversity using earth observations.

As biodiversity continues to diminish worldwide, careful monitoring is crucial. New sensors and missions from organizations such as NASA and ESA provide improved coverage and understanding of ecosystem processes and relationships.

The authors highlight several end-user challenges including a gap between the availability of observations and the products most needed by the biodiversity community. The white paper identifies CEOS Principals and the biodiversity community – particularly the Convention on Biological Diversity (CBD) and their Parties as well as the UN System of Environmental-Economic Accounting (UN SEEA) — as their targeted audience. To improve user engagement, Geller and colleagues recommend establishing a communication channel between CEOS and user communities through initiatives such as the UN System of Environmental-Economic Accounting and the Global Ecosystems Atlas Initiative. To advance technology, the authors recommend identifying key EO data sources and mapping approaches for each ecosystem class and helping users combine complementary data. Lastly, the authors recommend creating development resources like Massive Open Online Courses to improve the capacity for using EO for ecosystem mapping.

Geller, G. N., Levick, S. R., Luque, S., Sayre, R. (2023). CEOS, V1.1.

[Read Full Paper Here](#)

NASA Earth Science Research Results Portal

Attention NASA employees and NASA-funded investigators! The NASA Earth Science Research Results Portal is an internal database designed to make it easier for NASA Headquarters Leadership to find, communicate, and promote YOUR accomplishments. NASA funded investigators are encouraged to submit publications, impact stories, photos of field work, scientific visualizations and or other products that demonstrate how important NASA's unique perspective is for understanding Earth systems. Please direct questions to Megan McGroddy, megan.e.mcgroddy@nasa.gov.

[Access Research Results Portal](#)

Upcoming Events and Save the Dates

Catch up with Biodiversity and Ecological Conservation at an upcoming event:

Ocean Sciences Meeting

February 18 - 23

<https://www.agu.org/ocean-sciences-meeting>

Native American Fish and Wildlife Society Annual National

Conference May 13-16

<https://www.nafws.org/product/2024-national-conference/>

World Fisheries Congress

March 3-7

<https://wfc2024.fisheries.org/>

The Wildlife Society Conference

October 19-23

<https://twconference.org/>

North American Wildlife and Natural Resources Conference

World Biodiversity Forum

June 16-21

March 25-29

<https://wildlifemanagement.institute/conference>

[Welcome to the website of World Biodiversity Forum 2024!](#)

**Applied Earth Observations
Innovation Partnership Annual
Workshop**

23-25 April 2024

bit.ly/aeoip2024signup

Resources and Trainings

Upcoming ARSET Trainings:

- [ARSET - Large Scale Applications of Machine Learning using Remote Sensing for Building Agriculture Solutions](#)
March 05, 2024 - March 19, 2024
- [ARSET - Introduction to Lightning Observations and Applications](#)
March 26, 2024 - April 02, 2024

Applied Earth Observations Innovation Partnership Webinar Series

<https://www.aeoip.com/events>

Contribute Content for an Upcoming Newsletter

Thank you for sharing your highlights, news and publications with us! If you're part of a NASA-funded project (including students), we welcome your news, project updates, or announcements regarding published or forthcoming papers, reports, media, software, or events.

[Share your Highlights](#)

Team Spotlights

Each quarter we will feature members of our BDEC family!



Woody Turner

*BD Program Scientist
and EC Program
Manager*

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[LinkedIn](#)

Along with Keith Gaddis, I'm the program scientist for the Biological Diversity program and the program manager for the Ecological Conservation program at NASA Headquarters. As program scientist, I oversee the agency's basic research efforts to use satellite information to understand the relationship of biodiversity to climate, landscape change, and ecosystem function. As program manager, I co-direct an applications activity combining satellite data, ecological models, and in-situ observations to support decision making for nature conservation. My vision is an integrated NASA Earth System science effort bridging the divide between basic biodiversity research and real-world conservation to build a sustainable future for all. I have long felt called to contribute to maintaining and restoring the natural

world for future generations. In my free time, I enjoy the outdoors and books (and watching UNC basketball).

Fun fact: I am as enthusiastic about dinosaurs as the average six year old.



Melody Pederson

EC Intern

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[LinkedIn](#)

I'm a second-year Environmental Studies and Communication major at the University of California, Santa Barbara. As an Ecological Conservation outreach and communication intern, I am developing targeted one-pagers, writing newsletters, and creating other outreach materials for the program. I am extremely passionate about science communication and environmental justice. I believe that making environmental information accessible to the public is vitally important to overcoming the many challenges that face our planet. In my free time, I love playing beach volleyball and painting.

Fun fact: A quarantine hobby that I've continued is giving haircuts to myself, family, and friends.



Delaney Bellis

EC Intern

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I'm a current senior at the University of Tennessee, majoring in Ecology and Evolutionary Biology. As an outreach and communications intern with Ecological Conservation, I've enjoyed using my artistic skills to create interesting and engaging one-pagers, newsletters, and other digital products that inform targeted audiences about research or news relevant to the program. In the future, I hope to use my graphic design and illustration skills and my background in ecology to have a successful career as a science communicator. In my free time, I enjoy baking and cooking, taking care of my houseplants, and hiking in the Great Smoky Mountains.

Fun fact: I found a trilobite fossil last year!

Beaver-y Excited!

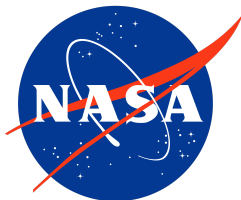


The Beaver Believers is not only the title of an award-winning documentary but a group of scientists who are passionate about restoring the North American Beaver to watersheds in the western United States. As a keystone species, beavers enrich the ecosystem and provide a variety of ecosystem services by building dams.

Beaver dams not only moderate stream temperature, creating diverse habitats throughout the stream, but also combat erosion damage by slowing the stream down so sediment can fill the channel back in.

The presence of this keystone species helps create diverse and resilient watersheds that can absorb the impacts of climate change, while the “Beaver Believer” mentality encourages us to work positively alongside the beavers.

Show your support with a sticker!



NASA's Biological Diversity & Ecological Conservation Program Managers:
Keith Gaddis and Woody Turner

Learn more about NASA's Biological Diversity & Ecological Conservation Program
<https://cce.nasa.gov/biodiversity/>

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To unsubscribe, please send an email to cce@support.nasa.gov requesting to be removed from the NASA Biodiversity & Ecological Conservation listserv.
